What is claimed is:

CLAIMS

1. A method for forming narrow trenches in a silicon substrate comprising the steps of:

etching the substrate to form first trenches separated by first silicon ribs;

performing a thermal oxidation of the substrate to form a silicon oxide layer developing inside and outside of the silicon, whereby second trenches narrower than the first trenches and second silicon ribs narrower than the first silicon ribs are obtained;

filling the second trenches with fingers of an etchable material;

etching the silicon oxide down to the upper surface of the second ribs while keeping silicon oxide portions between said etchable material fingers and the second ribs;

etching away the second silicon ribs and said etchable material fingers;

etching the silicon oxide for a duration sufficient to expose the substrate at the bottom of the silicon oxide portions, while leaving in place silicon oxide fingers; and

anisotropically etching the substrate between the oxide fingers to form narrow trenches in the substrate.

2. The method of claim 1, wherein the filling step includes the two following steps:

depositing a layer of an etchable material totally filling the second trenches and covering the silicon oxide layer; and

etching said layer of an etchable material for a duration sufficient to leave in place only fingers in the second trenches.

3. The method of claim 1, wherein an additional step of etching back of said silicon oxide fingers is provided.

4. The method of claim 3, further comprising the steps of:

depositing a filling layer formed of a material selectively etchable with respect to the substrate, the filling layer totally filling the narrow trenches and covering the substrate ribs separating the narrow trenches;

etching the filling layer to expose the substrate ribs, while keeping the material present between ribs;

performing a chemical-mechanical polishing of the upper portion of the ribs; and

etching back the material remaining between the ribs.

5. The method of claim 1, wherein the width and the spacing of the first trenches are identical and the duration of the thermal oxidation of the substrate is provided to obtain substantially identical narrow trenches.

6. The method of claim 1, wherein the etchable material used to fill the second trenches is polysilicon.

7. The method of claim 1, wherein the second silicon ribs and the etchable material fingers are etched simultaneously.

8. A method of forming trenches in a substrate, comprising:

forming first trenches in the substrate, the first trenches having a first width and being defined by first projections from the substrate having a second width;

forming second trenches within the first trenches, the second trenches having a third width narrower than the first width;

reducing the width of the first projections to form second projections having a fourth width that is less than the second width;

forming fingers of removable material within the second trenches;

exposing the fingers and the second projections;

selectively removing the second projections to expose respective individual regions of the substrate;

selectively removing the fingers of removable material from the second trenches;

removing a bottom of the second trenches to expose respective individual regions of the substrate for each second trench; and

removing portions of the substrate from the exposed individual regions to form third trenches in the substrate, the third trenches having the third and fourth widths of the second trenches and second projections, respectively.

9. The method of claim 8 wherein the substrate comprises a silicon substrate.

10. The method of claim 8 wherein the operation of reducing occurs during the operation of forming the second trenches.

11. The method of claim 8 wherein the first and second widths are approximately equal and wherein the third and fourth widths are approximately equal.

12. The method of claim 8 wherein forming second trenches within the first trenches and reducing the width of the projections to a fourth width that is less than the second width comprises thermally oxidizing the substrate to form an oxidized layer in the first trenches and on the projections having the second width.

13. The method of claim 12 wherein forming a removable material within the second trenches comprises forming a removable material within the second trenches and on the oxidized layer.

14. The method of claim 8 wherein selectively removing the second projections and selectively removing the fingers occur simultaneously.

15. An integrated circuit including a substrate having narrow trenches, wherein the narrow trenches are formed from a process comprising:

forming first trenches in the substrate, the first trenches having a first width and being defined by first projections from the substrate having a second width;

forming second trenches within the first trenches, the second trenches having a third width narrower than the first width;

reducing the width of the first projections to form second projections having a fourth width that is less than the second width;

forming fingers of removable material within the second trenches;

exposing the fingers and the second projections;

selectively removing the second projections to expose respective individual regions of the substrate;

selectively removing the fingers of removable material from the second trenches;

removing a bottom of the second trenches to expose respective individual regions of the substrate for each second trench; and

removing portions of the substrate from the exposed individual regions to form the narrow trenches in the substrate, the narrow trenches having the third and fourth widths of the second trenches and second projections, respectively.

16. The integrated circuit of claim 15 wherein the integrated circuit comprises a memory device.

18. The integrated circuit of claim 16 wherein the narrow trenches comprise a portion of a capacitor structure.

19. An electronic system, comprising:

an integrated circuit including a substrate having narrow trenches, wherein the narrow trenches are formed from a process comprising:

forming first trenches in the substrate, the first trenches having a first width and being defined by first projections from the substrate having a second width;

forming second trenches within the first trenches, the second trenches having a third width narrower than the first width;

reducing the width of the first projections to form second projections having a fourth width that is less than the second width;

forming fingers of removable material within the second trenches;

exposing the fingers and the second projections;

selectively removing the second projections to expose respective individual regions of the substrate;

selectively removing the fingers of removable material from the second trenches;

removing a bottom of the second trenches to expose respective individual regions of the substrate for each second trench; and

removing portions of the substrate from the exposed individual regions to form the narrow trenches in the substrate, the narrow trenches having the third and fourth widths of the second trenches and second projections, respectively.

20. The electronic system of claim 19 wherein the electronic system comprises a computer system.

21. The electronic system of claim 20 wherein the integrated circuit comprises a memory device.